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# A behavioural approach to understanding and addressing wood burning

STAKEHOLDER TOOLKIT

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# Introduction

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We would like to thank the stakeholders involved in the project steering group for this research, including:

- |   |                            |
|---|----------------------------|
| Asthma and Lung UK  | Mums for Lungs             |
| Clean Air Fund  | Rohit Chakraborty          |
| Client Earth  | (University of Sheffield)  |
| Imperial College London                                     | Dr James Heydon            |
| London Boroughs of Camden, Islington, Lambeth and Southwark | (University of Nottingham) |

This toolkit is based on work carried out by Kantar Public on behalf of Impact Urban Health, who had identified the air pollution associated with indoor burning as a significant public health issue, to:

- Explore public attitudes and behaviours around indoor wood burning using wood burning stoves
- Develop guidance around how to best communicate with the public about the potential health impacts of air pollution associated with indoor wood burning using wood burning stoves.

You can find more details on the research approach and findings in the [full report](#).

This toolkit is aimed at providing concrete support to a wide range of stakeholders working in this space, including Local Authorities, NGOs and other campaigning organisations.

It contains:

- **Well-evidenced guidance on how to communicate**, including a list of referenced claims, which stakeholders can use to develop effective messaging or integrate in their existing communications
- **Campaign materials** that have been tested amongst the public, which stakeholders can directly disseminate in their communication channels or adapt to their branding guidelines.

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# Woodburning: Large impacts and low awareness

Solid fuel burning in homes, which includes wood and a small proportion of coal, is the single biggest source of PM2.5 pollution, accounting for 27% of all emissions. The use of wood as a fuel accounts for 75% of these emissions, with an increase of 124% in PM2.5 from wood burning between 2011 and 2021..<sup>1</sup>

The growing contribution of domestic wood burning to PM2.5 emissions reflects an uptick in interest in wood burning stoves – with the Stove Industry Alliance reporting a 40% increase in sales between 2021 and 2022<sup>2</sup>. Many of these are likely to have been bought for the aesthetic purpose of creating a cosy atmosphere, rather than for more functional purposes or out of necessity.<sup>3</sup>

At the same time, there is currently very low awareness of the contribution of domestic woodburning to air pollution, which in quantitative research commissioned as part of this study was consistently ranked as the least significant source compared to road transport, manufacturing and industrial processes. Moreover, both burners and non-burners tend to have positive associations with wood burning, relating to warmth, cosiness, and comfort.<sup>4</sup>

Considering the significant impact of domestic wood burning on air pollution and current low levels of awareness around the issue, there is an opportunity to improve public health outcomes by communicating the harms and in turn reducing the uptake of burners and the use of existing burners. This toolkit aims to provide evidence-based guidance on how to most effectively communicate around the issue to inform the activities of stakeholders working in this space.

While we have tried to provide recommendations that can stand the test of time, it is important to acknowledge that the research was conducted in a specific time & context – and that any application of its findings will need to account for any changes in the social and political context.

In particular, this research was conducted prior to recent energy price rises, which have contributed to a cost of living crisis and created a greater focus on alternative heating sources. We have adapted materials where possible so that they are sensitive to this context, but sensitivities around the costs of all kinds of heating, including burning wood, should be kept in mind when communicating around this issue.

#1

**Domestic combustion is the #1 source of PM2.5 air pollution in the UK – and a greater contributor than either road transport or industrial combustion**

40%

**According to the Stove Industry Alliance, sales of wood burning stoves have increased +40% over the last year (2021 vs 2022)**

**People consistently underrate the impact of wood burning on PM2.5 air pollution compared to other sources**

<sup>1</sup> Defra (2023). Emissions of air pollutants in the UK – Particulate matter (PM10 and PM2.5) - February 2023 Defra report.

<sup>2</sup> Stove Industry Alliance (2022). Increase in wood burning stove sales points to consumers taking action to tackle heating bills. Retrieved from here.

<sup>3</sup> Kantar Public for Defra (2020). Burning in UK Homes and Gardens.

<sup>4</sup> Kantar Public's Behavioural Practice for Impact on Urban Health (2023). A behavioural approach to understanding and addressing wood burning – Combined report.



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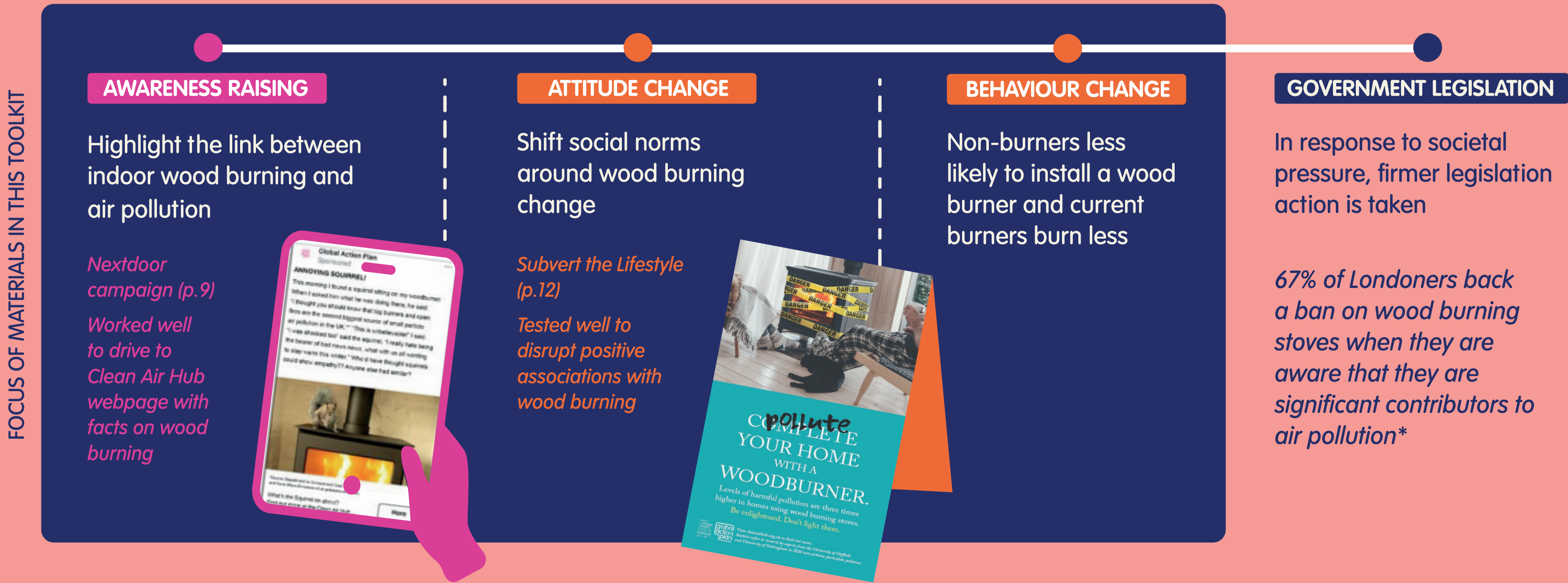
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# A strategy for effectively reducing wood burning

If awareness is raised then there is likely to be scope for further action, with recent research conducted for the Guardian showing that 67% of Londoners support a ban on wood burning stoves when they understand their contribution to air pollution.

We have therefore developed a multi-staged strategy, beginning with activity to raise the awareness of the link between woodburning and air pollution, and by doing so shifting social norms, influencing behaviour and – over time – opening up space for greater government legislative action in response to growing societal pressure.

The materials in this toolkit are focused on the early stages of this long-term vision.



# Principles for communicating effectively about the harms of wood burning

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**Focus on creating a strong link between wood burning and air pollution, ideally relative to other categories that are already strongly associated with air pollution.**

When research participants were shown wood burning's contribution to PM2.5 in comparison to that of road traffic or industry, this created attention and pre-empted the otherwise common argument that the contribution of wood is not worth worrying about.

**Suggest health impacts via messaging that stresses the significant contribution that wood burning makes to air pollution, rather than make them the central focus of messaging.**

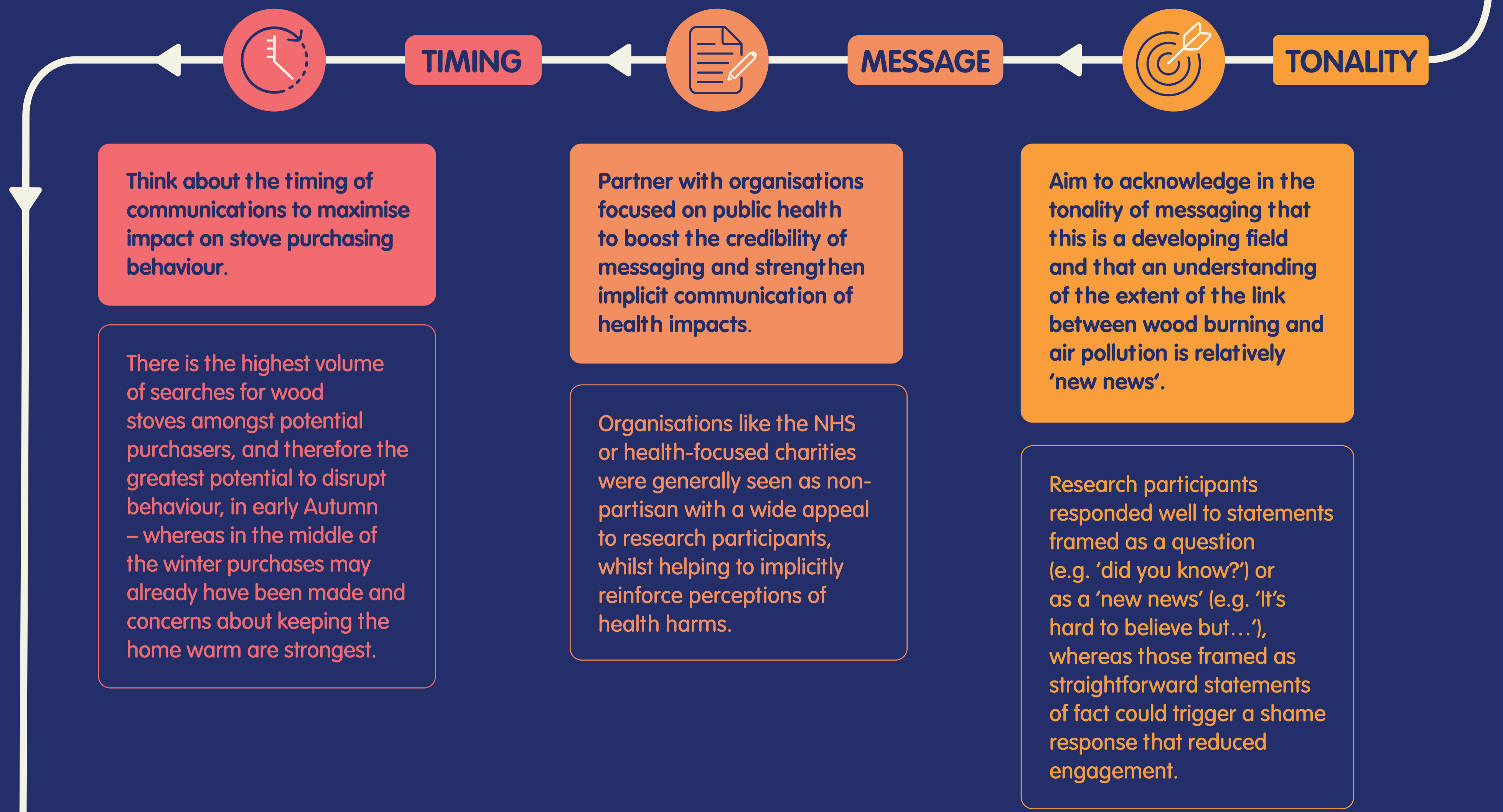
Given low levels of understanding of wood burning's contribution to air pollution, research participants often reacted defensively to messages or images that explicitly focused on health, and were more engaged by materials that allowed them to come to their own conclusions about the link with harmful pollution.

**Be factual about your statements, adding references and data points to support claims where possible.**

Research participants were often wary of agenda-driven campaigns and fact-based statistics typically helped to support a positive sense of impartiality and boost engagement.

To support you with this, you can find the latest, most convincing literature on [page 14](#) (Key messages and sources of evidence), and [page 15](#) (Literature consulted as part of this work).

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## AUDIENCE



**Focus communications on urban audiences where air pollution is already a salient issue.**

There are higher levels of concerns about air pollution in built-up urban areas and those using stoves are more likely to be doing so for aesthetic purposes alongside other heat sources.

**Focus communications on non-burners to maximise the behavioural and social impact of messaging.**

Stove owners taking part in research were already heavily invested habitually, emotionally and financially in using their wood burner and claimed to be unlikely to change their behaviour, whereas those intending to purchase a wood burner claimed to be quite likely to reconsider their options in the light of new information about air pollution.

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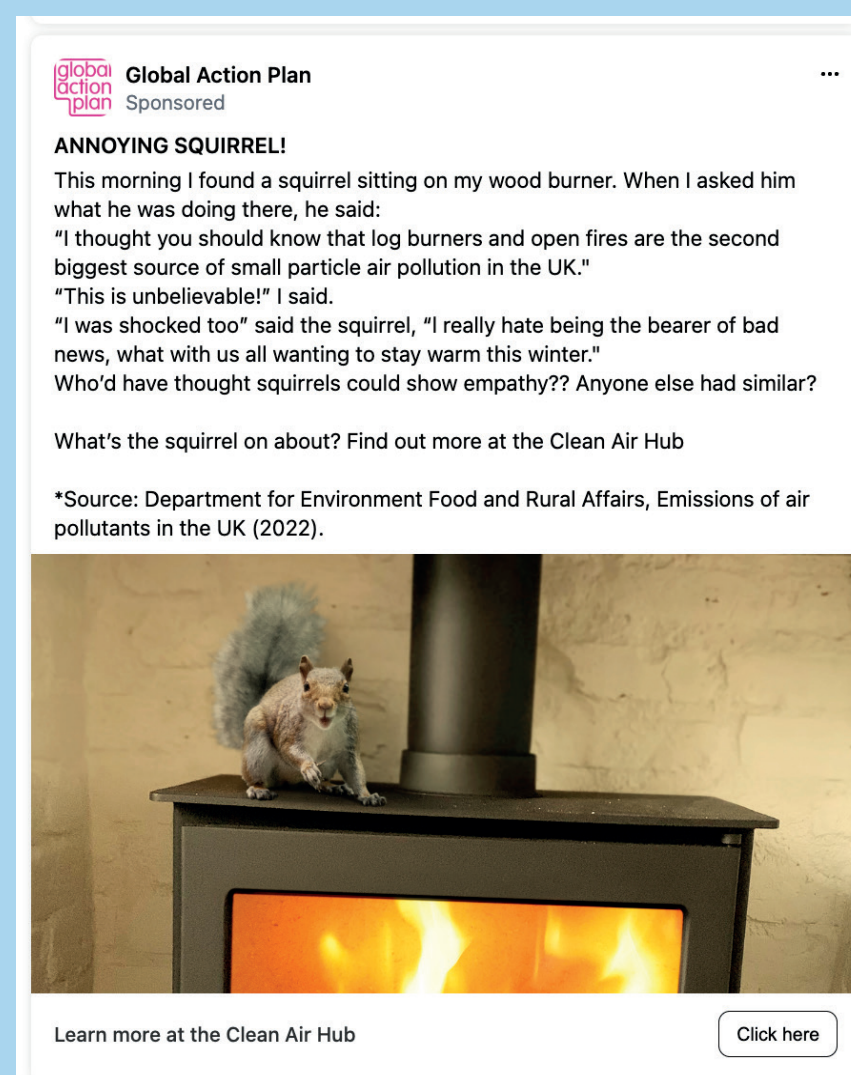
# Introducing the campaign assets

A set of open-sourced evidence-based assets for use by organisations communicating about the harms of woodburning.

These materials were produced based on an extended process of research and development, involving input from a wide range of stakeholders and the public, across qualitative and quantitative research (see *Appendix 1* for further details).

They are intended for use by Local Authorities, charities, campaigning bodies and other organisations concerned about the impacts of domestic wood burning on public health, to directly inform communication campaigns aimed at influencing public behaviour.

To use the assets, simply download the asset files using the links on the following pages.



## Nextdoor 'Animals' and 'Surprising Facts'

- Aimed at awareness raising around the link between wood burning and air pollution.
- Developed by Global Action Plan and Dog Cat and Mouse based on early insight from this research.
- Designed specifically for use on the NextDoor online platform.
- Initial launch in London in Winter '23 showed a strong performance in terms of clickthrough rate for animals route.



## 'Subvert the lifestyle'

- Aimed at driving attitude change and disrupting positive associations with wood burning.
- Developed by Dog Cat and Mouse based on insight from across multiple stages of research.
- Intended to work across channels, imitating the design of a typical 'lifestyle' ad.
- Qualitative research demonstrated strong cut-through and potential to undermine aspirational status of woodburning stoves.



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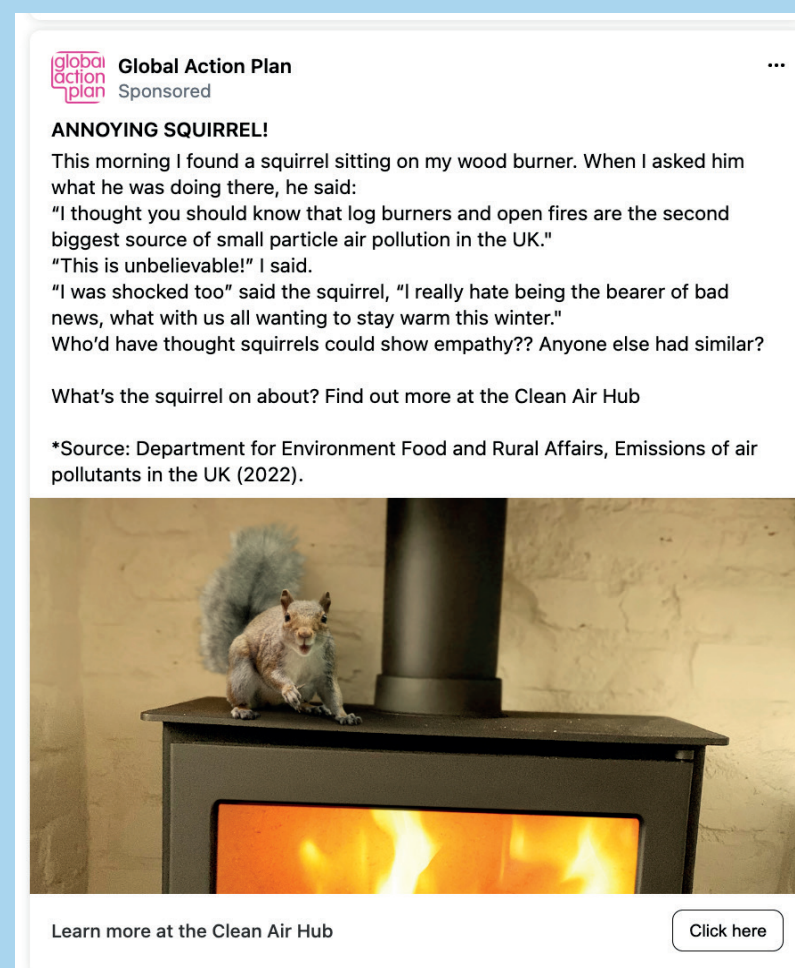
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## WHAT IS IT?

- Created by Global Action Plan and Dog Cat and Mouse based on early insight from this research – and run as a pilot campaign in Jan-Feb '23 in London.
- Developed specifically for Global Action Plan on the Nextdoor hyperlocal social media platform – whose users are aligned to wood burner users/buyers with 73% home owners and 46% more likely to have a household income of £125k+
- Leverages the insight that people are more likely to engage with new and surprising.

## WHAT IS THE EVIDENCE?

- Pilot showed a strong performance in terms of click-through rate to a dedicated information page on wood burning air pollution on the [Clean Air Hub](#).
- Users exposed to the campaign were more likely to take part in conversations around wood burning, helping to drive a 513% increase in mentions of the term 'wood burning' on the platform compared to Jan-Feb '22, and with 33% of webpage users surveyed saying they plan to burn less or stop burning.
- Due to the effects of the campaign, Clean Air Hub visits went up to 27,745 in Jan/Feb 2023, a 753% increase on the same period in 2022

## HOW TO USE IT?

- Designed specifically for Nextdoor reflecting the kind of local content typically posted on the site – but could potentially also be used on other social networking sites such as Facebook
- Squirrel execution performed most strongly (1.12%) – although there is value in also using Bird (1.05%) and Fox (0.74%) routes to avoid creative wear out
- Given focus on awareness raising (as opposed to behaviour change), may be best deployed in the Winter period when the use of wood burners is most relevant for both current owners and others

For more detail on the evaluation findings and recommendations, please contact Global Action Plan at: [tessa.bartholemewgood@globalactionplan.org.uk](mailto:tessa.bartholemewgood@globalactionplan.org.uk)





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# Awareness Raising: Nextdoor Information campaign assets

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**ANNOYING SQUIRREL!**

This morning I found a squirrel sitting on my wood burner. When I asked him what he was doing there, he said:  
"I thought you should know that log burners and open fires are the second biggest source of small particle air pollution in the UK."  
"This is unbelievable!" I said.  
"I was shocked too" said the squirrel, "I really hate being the bearer of bad news, what with us all wanting to stay warm this winter."  
Who'd have thought squirrels could show empathy?? Anyone else had similar?

What's the squirrel on about? Find out more at the Clean Air Hub

\*Source: Department for Environment Food and Rural Affairs, Emissions of air pollutants in the UK (2022).



[Learn more at the Clean Air Hub](#)[Click here](#)

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**INCREDIBLE TWEET!!**

Morning. This bird set off my door cam while I was at my yoga class. Incredibly it left a message about my wood burning stove, saying that every time people use their wood burner, they are inhaling air pollution.\* He also said "I'm aware this news comes at a bad time when we're all trying to stay warm this winter but wanted to share it before you heard it from another less caring source ... like the cat." Aww, bless.

What's the bird on about? Find out more at the Clean Air Hub ...

\*Source: Department for Environment, Food and Rural Affairs, Emissions of air pollutants in the UK (2022)



[Learn more at the Clean Air Hub](#)[Click here](#)

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**OMG I CAN'T BELIEVE THIS!!**

Hi all. 2 weeks ago I misplaced my egg timer. Today I realised a fox could've taken it. So I hid behind the sofa and he came back and dropped a note on the floor and left! It said -

"Hi. Homes with wood burners are three times more polluted than those without.\* For my cubs' sake please burn less. Thanks. Fox."

Even though this news is annoying given all we're going through, he used an apostrophe correctly so I for one will be cutting right back on my burning.

What's the fox on about? Find out more at the Clean Air Hub

\*Source: University of Sheffield/University of Nottingham research (2020)



[Learn more at the Clean Air Hub](#)[Click here](#)



# Attitude Change: Subvert the lifestyle



## WHAT IS IT?

- Created as part of an iterative process of research and development led by Kantar for Impact on Urban Health and Global Action Plan, with creative design by Dog Cat and Mouse.
- Developed specifically as an open-source asset for organisations seeking to communicate with the public around the harms associated with air pollution from the use of wood burning stoves.
- Parodies the kind of stereotypical advert for woodburning stoves found in lifestyle magazines, to highlight how wood burning stoves create indoor air pollution and disrupt their positive aspirational status.

## WHAT IS THE EVIDENCE?

- Qualitative research identified powerful cut-through based on a strong double-take effect, with a clear understanding of the intention to undermining the ways in which wood burning stoves are typically sold.
- Claims around pollution in home prompted particular concern amongst those with children and those planning to buy stoves, although could lack credibility for current owners given the lack of visible smoke or smoke smell

- Quantitative testing did not find any significant impact on attitudes – although this was amongst a general audience, whereas qualitative evidence suggests impacts are likely to be strongest amongst those planning to buy a wood burning stove.
- NB the original headline text was changed following testing from 'Heat your home' to 'Complete your home' in acknowledgment that the original wording could prompt a shame response in the context of a cost of living and energy crisis.

## HOW TO USE IT?

- Given the creative design of this ad, which replicates a lifestyle ad from a glossy magazine, its impact may be most powerful in channels focused on 'lifestyle' ads – including print and social media.
- Given the focus on attitude change, effectiveness is likely to be stronger once there is already a clear link established for the public between wood burning and air pollution.
- Likely to be best deployed in late Summer or early August when people are most likely to be considering the purchase of a woodburning stove, to help introduce friction into the process.

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# Attitude Change: As Subvert the Lifestyle was originally designed to fit in a lifestyle magazine, it is key to retain the 'magazine' feel even in online contexts

## DESCRIPTOR

For Subvert the Lifestyle, the idea here is the subversion of a 'lifestyle' ad that is selling the woodburner dream.

To give the layout a 'magazine' feel, **the image should be somewhere near half of the total area** and the crop should, of course, make the woodburner the focus.

The type should have **plenty of air around it** and the strap line should always be defined in yellow. Moreover, **the word 'pollute' should be positioned so that it is obviously a replacement for the word 'complete'**, but it should still allow us to be able to read the original headline.

Download the original files for use 





# APPENDIX 1: The research & development process

The findings and recommendations in this toolkit are based on an iterative programme of research and development carried out by Kantar's Public Behavioural Practice between 2020-2022.

This work was aimed at:

- **Scaling the prevalence of the issue** at a national level, with a focus on urban areas (specifically London)
- **Understanding people's wood burning behaviour**, especially with wood burning stoves
- **Identifying opportunities for intervention**, by exploring existing behaviours, motivations, attitudes and beliefs
- **Developing and testing concepts for a potential national campaign** aimed at reducing air pollution associated with wood burning at home.

The work progressed across four project stages structured around the Kantar Public Behavioural Practice's DEEP project process\*:



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# APPENDIX 2: Key messages and sources of evidence

## KEY MESSAGES

"Burning an eco-certified wood stove for one hour gives off the same level of harmful air pollution as running 18 diesel cars or 6 diesel HGVs for one hour" OR "In an hour, wood burning produces the same harmful PM2.5 air pollution as 6 HGVs"

"Emissions of PM2.5 from domestic wood burning to represent 17 per cent of total PM2.5 emissions in 2020" OR "Wood burning produces nearly a fifth of all harmful PM2.5 air pollution in the UK"

"Domestic wood burning is the number two source of PM2.5 air pollution in the UK"

"In the UK, emissions of PM2.5 from domestic wood burning increased by 35 per cent between 2010 and 2020"

"Wood burning contributes to 17% of London's harmful PM2.5 air pollution" OR "Wood burning produces nearly a fifth of London's PM2.5 air pollution"

"Less than 5% of London homes do it, but they contribute 17% of London's harmful PM2.5 air pollution"

"Levels of harmful PM2.5 pollution are 3x higher in homes using wood burning stoves" OR "Harmful pollution is 3 times higher in homes with wood burners"

"Every time you smell wood burning, you are inhaling harmful PM2.5 air pollution"

## SOURCES OF EVIDENCE

Source: Air Quality Expert Group (UK) (2017) Potential Air Quality Impacts from Biomass Combustion.

Source: Emissions of air pollutants in the UK – Particulate matter (PM10 and PM2.5). February 2022 DEFRA report.

Source: Emissions of air pollutants in the UK – Particulate matter (PM10 and PM2.5). February 2022 DEFRA report.

No specific source.

## REMEMBER TO...



- Specify that we are talking about "small particle air pollution" (or PM2.5), to avoid confusion with air pollution caused by other emissions such as NO or CO<sub>2</sub> emissions.
- If not specified in the tagline, avoid confusion by clarifying the context you're referring to (is it in the home/ in London/ in the UK...) with an asterisk.
- Add an asterisk with more information or the source directly, to substantiate your claims and give people the chance to look up more information if they want to.

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# APPENDIX 3: Literature consulted as part of this work

## KEY REFERENCES LIST

Kantar Public report for Defra (2020)	"Burning in UK Homes and Gardens"
Research Works report for Defra (Oct 2020)	"Developing and testing behavioural insight informed communication messages about domestic burning" (Qual)
Defra (Oct 2020)	"Domestic burning communications: Testing the effectiveness of behaviourally informed messages on increasing awareness about domestic burning in England" (Survey)
Gary Fuller (2018)	The Invisible Killer: The rising global threat of air pollution – and how we can fight back
Hackney Council (2020)	Hackney's Zero Emissions Network Interim Report (2020) "Fuel burning Engagement Project"
World Health Organisation (2015)	"Residential heating with wood and coal: health impacts and policy options in Europe and North America"
Chakraborty, R., Heydon, J., Mayfield, M., & Mihaylova, L. (2020)	"Indoor air pollution from residential stoves: Examining the flooding of particulate matter into homes during real-world use"
Air Quality Expert Group (2017)	"The Potential Air Quality Impacts from Biomass Combustion"
Kantar Public's Behavioural Practice report for Impact on Urban Health (2023)	"A behavioural approach to understanding and addressing wood burning – Combined report"
Chief Medical Officer (2022)	"Chief Medical Officer's Annual Report - Air pollution"